



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,594	07/20/2006	Naohisa Higashiyama	292504US40PCT	1654
22850	7590	03/08/2010	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			MCKINNON, TERRELL L.	
ART UNIT	PAPER NUMBER			
			3744	
NOTIFICATION DATE	DELIVERY MODE			
03/08/2010	ELECTRONIC			

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,594	<b>Applicant(s)</b> HIGASHIYAMA, NAOHISA
	<b>Examiner</b> TERRELL L. MCKINNON	<b>Art Unit</b> 3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

1) Responsive to communication(s) filed on 20 July 2006.

2a) This action is FINAL.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

4) Claim(s) 1-19 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-19 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 20 July 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement (PTO-1448)  
 Paper No(s)/Mail Date 7/20/2006

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-6, 9-10 and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (U.S. 2004/0159121) in view of Mackie (U.S. 1,024,641).

Re. Cl. 1, Horiuchi discloses a heat exchanger comprising a refrigerant inlet (11) header and a refrigerant outlet (12) header arranged side by side in a front-rear direction at an upper end of the heat exchanger, and a refrigerant circulating passage for holding the two headers in communication there through, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet, a refrigerant being flowable into the inlet header from the inlet and thereafter returnable to the outlet header through the circulating passage so as to be sent out from the heat exchanger through the outlet (Figs. 5 and 6),

the refrigerant inlet being provided in a closing member closing an opening of the inlet header at said end thereof, the closing member having a lower edge defining the inlet (Figs. 15a-15b).

Horiuchi's invention fails to disclose a guide slanting upward inwardly of the inlet header.

However, Mackie teaches a header comprising a guide (10) slanting upward inwardly of the inlet header.

Given the teachings of Mackie, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat exchanger of Horiuchi with a guide slanting upward inwardly of the inlet header.

Doing so would provide a fluid flow directing means for increasing the cooling efficiency of the heat exchanger.

Re. Cl. 3, Horiuchi discloses the very obvious modification wherein the refrigerant inlet of the inlet header is circular and has an inside diameter of 3 to 8.5 mm, for the purpose of providing an inlet with the proper size to allow for effective circulation based on a given size requirement of a heat exchanger.

Re. Cl. 6, Horiuchi discloses the closing member (15) has a first closing portion closing said end opening of the inlet header and a second closing portion closing an opening at said end of the outlet header alongside the inlet, the first closing portion being provided with the refrigerant inlet and the guide, the second closing portion being provided with the refrigerant outlet.

Re. Cl. 13, Horiuchi discloses the refrigerant circulating passage comprises a plurality of intermediate headers and a plurality of heat exchange tubes (Figs. 1-9 and 11-15)

Re. Cl. 14, Horiuchi discloses the outlet header is disposed in the rear of the inlet header, and the refrigerant circulating passage comprises a refrigerant inflow intermediate header disposed below and opposed to the inlet header, a refrigerant outflow intermediate header disposed below and opposed to the outlet header and a plurality of heat exchange tubes, the inflow intermediate header being in communication with the outflow intermediate header, the plurality of heat exchange tube being arranged at a spacing between each of the opposed pair of inlet header and inflow intermediate header and the opposed pair of outlet header and outflow intermediate header to

provide a tube group in the form of at least one row and constitute a heat exchange core, the heat exchange tubes of the tube group having opposite ends joined to the respective headers opposed to each other.

Re. Cl. 15, Horiuchi discloses the outlet header has interior partitioned by dividing means (42) into first and second two spaces arranged in the direction of height, and the heat exchange tubes extend into the first space, the dividing means being provided with a refrigerant passing hole (42a), the second space of the outlet header being in communication with the refrigerant outlet.

Re. Cl. 16, Horiuchi discloses the inlet header and the outlet header are provided by dividing interior of one refrigerant inlet-outlet tank into a front and a rear portion by separating means (31).

Re. Cl. 17, Horiuchi discloses the inlet-outlet tank comprises a first member (20) having the heat exchange tubes joined thereto, a second member brazed to the first member at a portion thereof opposite to the heat exchange tubes and closing members brazed to opposite ends of the first and second members, the separating means and the dividing means being integral with the second member.

Re. Cls. 18 and 19, Horiuchi discloses a refrigeration cycle comprising a compressor, a condenser and an evaporator, the evaporator comprising a heat exchanger; and a vehicle having installed therein a refrigeration cycle ([0004]).

Re. Cls. 2. 4 and , Horiuchi fails to discloses wherein the guide is in the form of a segment of a sphere; the guide has a projecting end face positioned on a slanting plane inclined with respect to a vertical inner surface of the closing member; the slanting plane

having the projecting end face of the guide positioned thereon makes a minor angle of inclination of 15 to 60 degrees with the vertical inner surface of the closing member.

However, Mackie teaches a header comprising a guide (10) slanting at an angle upward inwardly of the inlet header in the form of a segment of a sphere; and the guide has a projecting end face positioned on a slanting plane inclined with respect to a vertical inner surface of the closing member (Fig. 3).

Given the teachings of Mackie, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat exchanger of Horiuchi with the guide in the form of a segment of a sphere; the guide has a projecting end face positioned on a slanting plane inclined with respect to a vertical inner surface of the closing member; the slanting plane having the projecting end face of the guide positioned thereon makes a minor angle of inclination of 15 to 60 degrees with the vertical inner surface of the closing member

Doing so would provide an angled fluid flow directing means for guiding heat exchanged fluid through the heat exchanger.

5. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi et al. (U.S. 2004/0159121) in view of Mackie (U.S. 1,024,641), as applied to claim(s) above, and further in view of Yasuyuki et al. (JP 6-241614).

Re Cls. 7 and 8, Horiuchi's invention as modified by Mackie, discloses all of the claimed limitations from above except for wherein the inlet header has a joint plate joined to said end thereof and having a refrigerant inlet portion in communication with

the refrigerant inlet of the closing member, the refrigerant inlet of the inlet header having a center upwardly deviated from a center of the refrigerant inlet portion of the joint plate; wherein the deviation of the center of the inlet portion is 0.5 to 3mm.

However, Yasuyuki teaches wherein the inlet header has a joint plate joined to said end thereof and having a refrigerant inlet portion in communication with the refrigerant inlet of the closing member, the refrigerant inlet of the inlet header having a center upwardly deviated from a center of the refrigerant inlet portion of the joint plate (Figs. 1-9).

Given the teachings of Yasuyuki, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the heat exchanger of Horiuchi with wherein the inlet header has a joint plate joined to said end thereof and having a refrigerant inlet portion in communication with the refrigerant inlet of the closing member, the refrigerant inlet of the inlet header having a center upwardly deviated from a center of the refrigerant inlet portion of the joint plate; wherein the deviation of the center of the inlet portion is 0.5 to 3mm.

Doing so would provide an inlet connection wherein any off sets in the connecting piping based on design requirements wont effect the cooling efficiency of the heat exchanger.

Re. Cl. 9, Horiuchi discloses the joint plate ((15) Figs. 15a and b) extends across and is joined to both the inlet header and the outlet header, and the plate has a refrigerant outlet portion communicating with the refrigerant outlet in addition to the refrigerant inlet portion in communication with the refrigerant inlet (Figs. 15a and b).

Re. Cls. 10 and 12, Horiuchi discloses a refrigerant inlet pipe is joined to the refrigerant inlet portion of the joint plate, and a refrigerant outlet pipe is joined to the refrigerant outlet portion; and the very well known use of an expansion valve member having passages communicating with the inlet and outlet portion ([0004]).

Re Cl. 11, Horiuchi's invention as modified by Mackie, discloses all of the claimed limitations from above except for the inlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant inlet portion of the joint plate, and the outlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant outlet portion of the joint plate, the inlet pipe and the outlet pipe being joined to the joint plate.

However, Yasuyuki teaches the inlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant inlet portion of the joint plate, and the outlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant outlet portion of the joint plate, the inlet pipe and the outlet pipe being joined to the joint plate (Figs. 1-9).

Given the teachings of Yasuyuki, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the heat exchanger of Horiuchi with the inlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant inlet portion of the joint plate, and the outlet pipe has a constricted portion formed at an end portion thereof and inserted into the refrigerant outlet portion of the joint plate, the inlet pipe and the outlet pipe being joined to the joint plate.

Doing so would provide a reliable means of connecting external flow devices to the inlet and outlet header portions.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references cited on the PTO892 discloses related limitations of the applicant's claimed and disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TERRELL L. MCKINNON whose telephone number is (571)272-4797. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

March 1, 2010  
/Terrell L Mckinnon/  
Primary Examiner, Art Unit 3744